BRIEFER ARTICLES

A TROPISM CHAMBER

(WITH THREE FIGURES)

A few years ago the writer planned some classroom experiments to illustrate the geotropism of roots. The students wasted much time and many seedlings because of the wilting of the roots while they were transferring them to the observation chambers and fastening them to their supports. To overcome this difficulty some special tropism chambers were designed. These have given excellent satisfaction, and have proved to be so well adapted to the study of tropic responses that their use has suggested a number of new classroom experiments, which would have been impracticable without this apparatus.

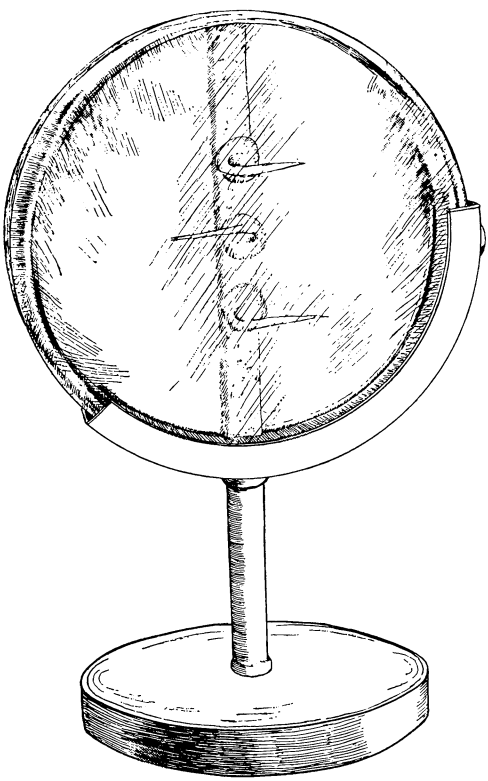

FIG. 1

The first makeshift contrivance consisted simply of a Petri dish, 4–5 inches in diameter, with a small piece of cork cemented to the bottom, near one side. The dish was partly lined with wet filter paper. The seedling was pinned to the cork and the dish set on edge on top of an ordinary tumbler. The curvature of the top of the tumbler made a convenient support for the cover of the Petri dish. The Petri

dish could be rotated and the radicle of the seedling quickly brought to any desired angle with the vertical.

The makeshift apparatus served the purpose fairly well, but the tumbler support was not always convenient. A special support was then constructed. As will be seen from the drawings, the support consists of a circular trough (of brass) mounted on a pedestal. There are two sockets for attaching the trough to the pedestal, which screws into the socket. These sockets are 90° apart. The purpose of the extra socket is shown in fig. 2, where the tropism chamber is shown attached to a regular laboratory support. This arrangement is for use with the horizontal microscope.[1] The chamber may be transferred from the base to the laboratory support without altering the position of the seedling.

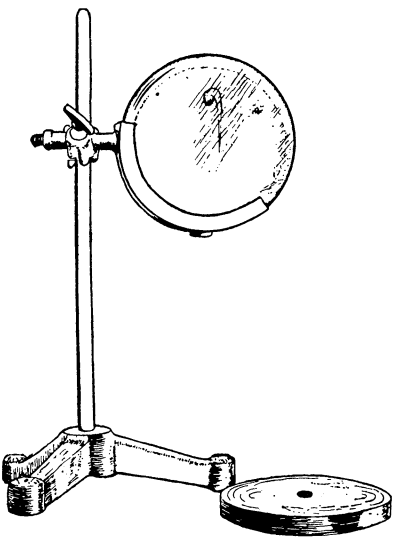

FIG. 2

Fig. 1 shows the chamber provided with a strip of cork so as to make room for several seedlings. The drawing is from an experiment to illustrate traumatropism.

Fig. 3 shows the improved apparatus. The support is provided with a scale marked in degrees. This makes it possible to place the seedling at any desired angle with the vertical. Four marks etched or scratched on the cover of the Petri dish 90° apart serve as pointers. Into a hole, bored through the bottom of the Petri dish, a cork is inserted. The seedling is pinned to the inner face of the cork. The cork can be moved from the outside and it is possible, therefore, to make the final adjustments of the position of the seedling (for example, bringing the radicle parallel with the faces of the chamber) without opening the Petri dish.

[1] The tube from any compound microscope, clamped to a laboratory support, will serve as a horizontal microscope. A hair stuck to the diaphram in the eyepiece will serve as a cross-hair.

The bottom of the Petri dish is ruled into 5 mm. squares. The squares not only aid in determining the angles made by the bending root, but also serve as markers to locate the regions of growth and curvature. A sheet of coordinate paper pasted over the bottom of the dish will serve nearly as well as the cross-ruling. Thin paper, such as is used for making blue-print tracings, is best. The paper can be made more transparent by wetting it with a mixture of alcohol, glycerine, and water.

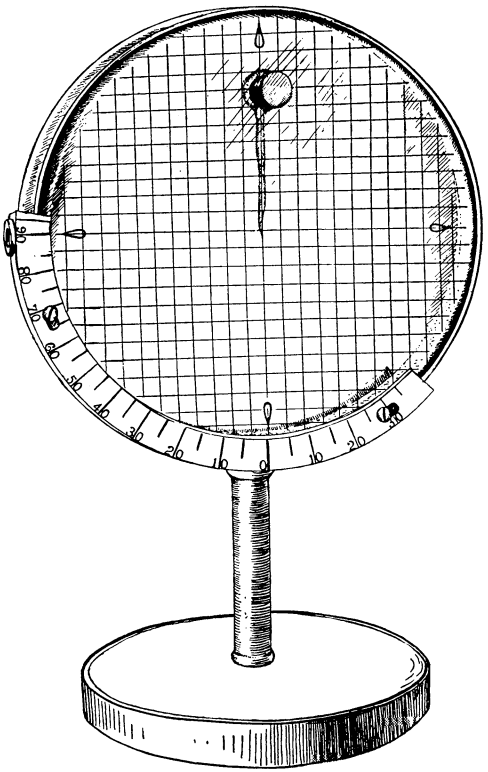

FIG. 3

Seedlings may be grown for a number of days in the chambers. It is possible, therefore, to place the seedlings in the chambers some time previous to the time set for the experiments. If the filter paper lining the chamber is placed symmetrically, so as to avoid hydrotropic curvatures, the radicles will grow straight downward. The chamber can now be rotated and the seedling quickly brought to any desired angle with the vertical, and without exposing it to the dry air of the laboratory. The chambers are excellent for experiments on perception and latent periods, and for periodic responses.—W. T. BOVIE, *Laboratory of Plant Physiology, Harvard University.*